

**RAY HOLTMAN FARM SITE, QUINCY ILLINOIS
FINAL PROJECT REPORT
JANUARY 8, 1998**

US EPA RECORDS CENTER REGION 5



540140

1.0 Introduction

The Ray Holtman Farm site (the site) is a former municipal landfill located in Adams County, Illinois approximately two miles south of the town of Quincy (Figure 1). The 160-acre farm is located in an upland rural agricultural area approximately 1/4 mile east of the bluffs of the Mississippi River valley. From the late 1950s until the early 1970s, the city of Quincy used the site for the disposal of municipal solid waste. It is estimated that there are six disposal areas at the site covering a total of approximately 45 acres (Figure 2).

The Holtman residence and farm buildings are located in the northeast corner of the property. The rest of the site, including the land filled areas, is cultivated farm and pasture land with some wooded areas. The land filled areas are divided by an access road running roughly east-west across the property. An intermittent stream, Ghost Hollow Creek, runs adjacent to the land filled areas north of the access road and discharges to the Mississippi River approximately 2 miles downstream of the site. A second unnamed intermittent stream located south of the land filled areas discharges to the wetlands of the Mississippi floodplain approximately 1 mile downstream of the site.

Based on local topography, shallow groundwater at the site is expected to flow west-northwest toward Ghost Hollow Creek, and west-southwest toward the unnamed stream. Regional groundwater is expected to flow west toward the Mississippi River. Two municipal wells, six wells serving mobile home parks and approximately 3 to 7 private residential wells are located within approximately 1/2 mile of the site and are potentially down gradient of the site (Table 1).

2.0 Site History

The Illinois Environmental Protection Agency (IEPA) conducted a preliminary assessment (PA) of the site in 1988, and in August 1990 the site was added to the Comprehensive Environmental Response, Compensation and Liability Act Information System (CERCLIS). In 1991, U.S. EPA contracted with Black & Veatch Waste Science and Technology (BVWST) to conduct a screening site inspection (SSI). A site visit was conducted in October 1991 and two soil samples and two sediment samples were collected from the site in February 1992. Background samples were also collected. The results of the sampling indicated low level of metals, pesticides and two semivolatiles. The results of the SSI indicated were finalized in the SSI report in March 1993. Also, the U.S. EPA conducted two more site investigations in both 1995 and 1997 to confirm and further characterize the contaminants in question. See section 3 for details about sampling activities with respect to migration pathways.

Approximately 3,000 residents are served by groundwater from two municipal wells located approximately 1/2 mile west of the site. These wells are located in the floodplain of the Mississippi River and are 80 and 90 feet below the ground surface at estimated elevations of approximately 394 and 384 feet above mean sea level (msl). Additional wells serving three mobile home parks are located 1/2 mile northwest and 1/2 mile southwest of the site, also in the floodplain. These wells range in depths from approximately 370 to 445 ft-msl.

Approximately 3 to 7 private residential wells are located along the river bluff approximately 1/4 to 1/2 mile from the site. Three to five of the wells are located in a residential area 1/4 mile southwest of the site. Another residential well is located on the river bluff 1/2 mile northwest of the site. An inoperable well is located 1/4 mile west of the site at an uninhabited property.

The Mill Creek Water District municipal wells are located approximately 1/2 mile west of the site and supply water to approximately 3,000 residents. These wells are located in the floodplain of the Mississippi River and are 80 and 90 feet below the ground surface (ft-bgs), at estimated elevations of approximately 394 and 384 feet above mean sea level (msl). Two wells serving the Gardner Expressway Mobile Home Park are located in the floodplain of the Mississippi River approximately 1/2 mile northwest of the site. These wells are 65 and 110 ft-bgs, at estimated elevations of approximately 425 and 380 ft-msl. Six wells serving three mobile home parks are located 1/2 mile northwest and 1/2 mile southwest of the site, also in the floodplain. These wells range in depths from approximately 370 to 445 ft-msl.

A review of records for water wells (ISWS, 1992) located within one mile of the site shows three types of aquifers are tapped for drinking water. Wells drawing water from buried sand and gravel outwash are approximately two hundred feet east and six hundred feet southeast of the site. Two other nearby wells, approximately eight hundred feet southeast of the site, draw water from a shallow limestone aquifer encountered 50 feet below the ground surface. About three quarters of a mile west and southeast of the site, three wells penetrate an alluvial aquifer in the Mississippi River flood plain.

Many rural residences within four miles of the site use private wells. Quincy supplies its residents with Mississippi River water from an upstream intake. This distribution extends to Mellview Road, which is about one and one half miles south of the city limits (Quincy Water Department, 1991). Mellview road is about two miles north of the Holtman Farm. The Mill Creek Water District (MCWD) has two wells located about a half mile west of the Holtman Farm property (MCWD, 1992a). The MCWD serves about three thousand people in an extensive area south of Quincy and in a thin band along the southern edge of the region served by Quincy's water system (MCWD, 1992b). Table 1-1 summarizes the MCWD wells.

Table 1-1 Public Water Supply sources Within Four Miles of Holtman Farm				
Distance/Direction From Site	Source Name	Location of Source	Approximate Population Served	Source Type
About 1/2 mile west	Mill Creek Water District	NE 1/4, NE 1/4, sec. 26, T2S, R9W	1560	Alluvial well 80 feet deep.
About 1/2 mile west	Mill Creek Water District	NE 1/4, NE 1/4, sec.26, T2s, R9W	1560	Alluvial well 90 feet deep

Sources: MCWD, 1992a, 1992b; ISWS 1992

An estimated population of 331 people use private wells within four miles of the site. Table 1-1 presents the estimated population. To estimate the populations, the number of houses in each distance ring was counted from USGS topographic maps, and multiplied by the Adams County average of 2.5 persons per household (U.S. Department of Commerce, 1991).

Table 1-2 Private Well Users	
Radial Distance (Miles)	Approximate Population
0.00-0.25	5
0.25-0.50	26
0.50-1.00	33
1.00-2.00	73
2.00-3.00	103
3.00-4.00	91
Total Population:	331

Sources: USGS, 1971a; 1971b; 1971c; 1971d; U.S. Department of Commerce, 1991.

2.1 Operational History

Holtman Farm is a part of the estate of Martha Holtman. The site was owned by Ray and Martha Holtman during landfill operations. It is not known who owned the property before Ray and Martha Holtman. After Ray Holtman's death, Martha Holtman owned the property until her death on February 25, 1992. Mary Butler, Martha and Ray Holtman's daughter, was the executrix of Martha Holtman's will, which split the estate into equal shares between Mary Butler and her daughter, Laura Daggett.

Exact dates for the beginning and end of landfill operations are unavailable. The city of Quincy land filled refuse onsite from the late 1950's until the early 1970's (IEPA, 1988). Waste disposal practices during active filling are unknown. Ray Holtman and his son operated the site and are deceased. Before her death, Martha Holtman said four areas of the site were land filled south of Ghost Hollow Creek. She stated up to three loads of refuse were dumped each weekday and covered with clayey fill and topsoil. Cover came from two onsite borrow pits. Martha Holtman did not know how often refuse was covered or how much cover was used. She also stated that tires were dumped near 24th Street after operations ceased. In the recent years, illegal refuse dumping occurred along the creek banks. Since land filling ceased, the tillable acreage at the site has been farmed. Matt Keller now farms the property.

3.0 Characterization of Sources

Surface Water

In 1995, the U.S. EPA collected surface water samples that revealed one SVOC (4-Methylphenol) above background (See Surface Water Tables). Also, several inorganics were found to be above background and/or ecotox threshold. The U.S. EPA also conducted another sampling investigation to further characterize the inorganics in question. This investigation yielded that potentially adverse ecological effects can be ruled for all inorganics in question except for Barium and Manganese. However, the levels at which both of these contaminants exist are below the background levels. Since high levels of Barium and Manganese occur naturally, these inorganics will not pose potentially adverse ecological effects.

Surface Soil

In 1993, The U.S.EPA collected surface soil samples that revealed one SVOC (bis(2-Ethylhexyl)phthalate) to be above background (See Surface Soil Tables). Moreover, several inorganics were also found to be above background. There is no Risk Based Criteria for the inorganics that were found to be above background.

Sediments

In 1995, The U.S.EPA conducted sediment samples that revealed several inorganics to be above background (See Sediments Tables). There is no ecotox threshold for the inorganics in question.

Residential Wells

In 1995, the U.S. EPA collected surface water samples of residential wells (RW-5) northwest side of the site and at (RW4) southwest of the site. It has been revealed that iron is the only inorganic of concern. The concentrations found for iron exceed risk based MCL levels. It was also discovered that Bis(2-Ethylhexyl)phthalate is present in the residential well above background, risk based MCL levels and ecotox threshold. (See residential well tables.)

For the reasons above, the U.S.EPA conducted another site investigation to confirm the initial concentrations of bis(2-ethylhexyl)phthalate in the residential well. From this site visit it was found that the concentrations of bis(2-ethylhexyl)phthalate (in accordance with risk assessment guidance volume 1) will not pose a direct threat to human health and environment.

Groundwater

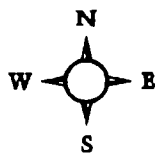
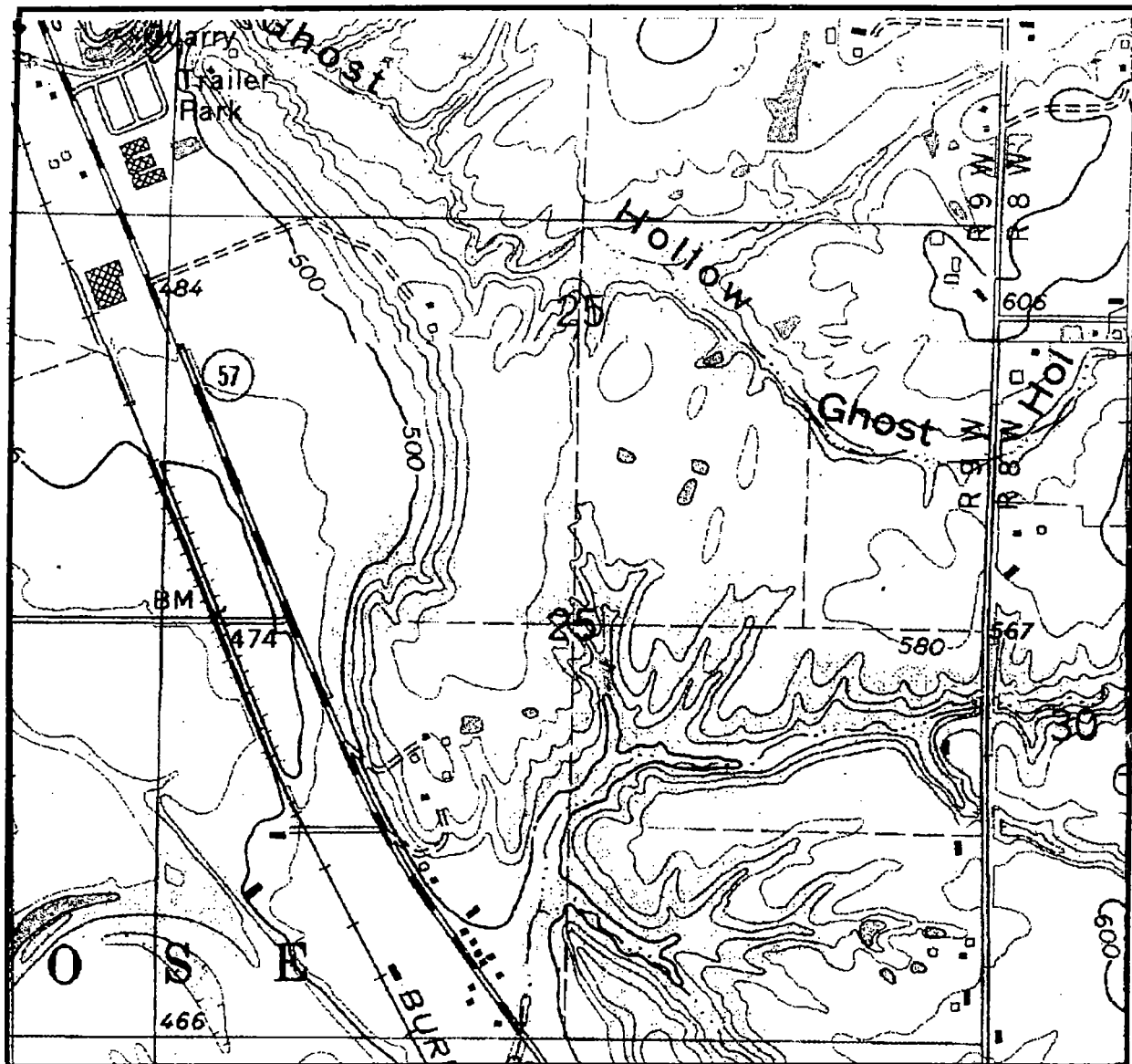
In 1995, the U.S.EPA collected groundwater samples at the southwest, northwest, south central and west central areas of the landfill. Bis(2-Ethylhexyl)phthalate was found above MCL's in the south central and northwest landfill locations. Furthermore, several inorganics were found to be above background and only four inorganics (arsenic, iron, manganese, nickel) were found to be above background and criteria. (See groundwater tables)

Although the aforementioned contaminants are indeed present. Migration of potential contaminants in onsite soil to local aquifers is unlikely. Based on geological data gathered as well as a series of maps showing the potential for hazardous substances to be released at the ground

surface to migrate into the first subjacent water producing zone. ISGS deem the migration potential low near the site. Moreover, the presence of a unit of uniform, relatively impermeable material at least 20 feet thick, with no evidence of interbedded sand or gravel makes migration potential very unlikely.

In conclusion, based on the findings of the screening site inspection report, and all sampling investigations conducted by the U.S.EPA it is our recommendation that no further action (federal) be conducted concerning the Ray Holtman Farm Site.

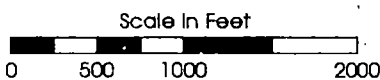
Ray Holtman Farm



Technical Support Section
Chicago, Illinois

Index Map

Illustration From USGS Topographic Map
Quincy West, Ill.-Mo. and Quincy SW, Mo.-Ill.
7.5 Minute Series

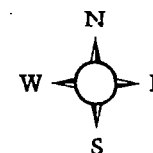
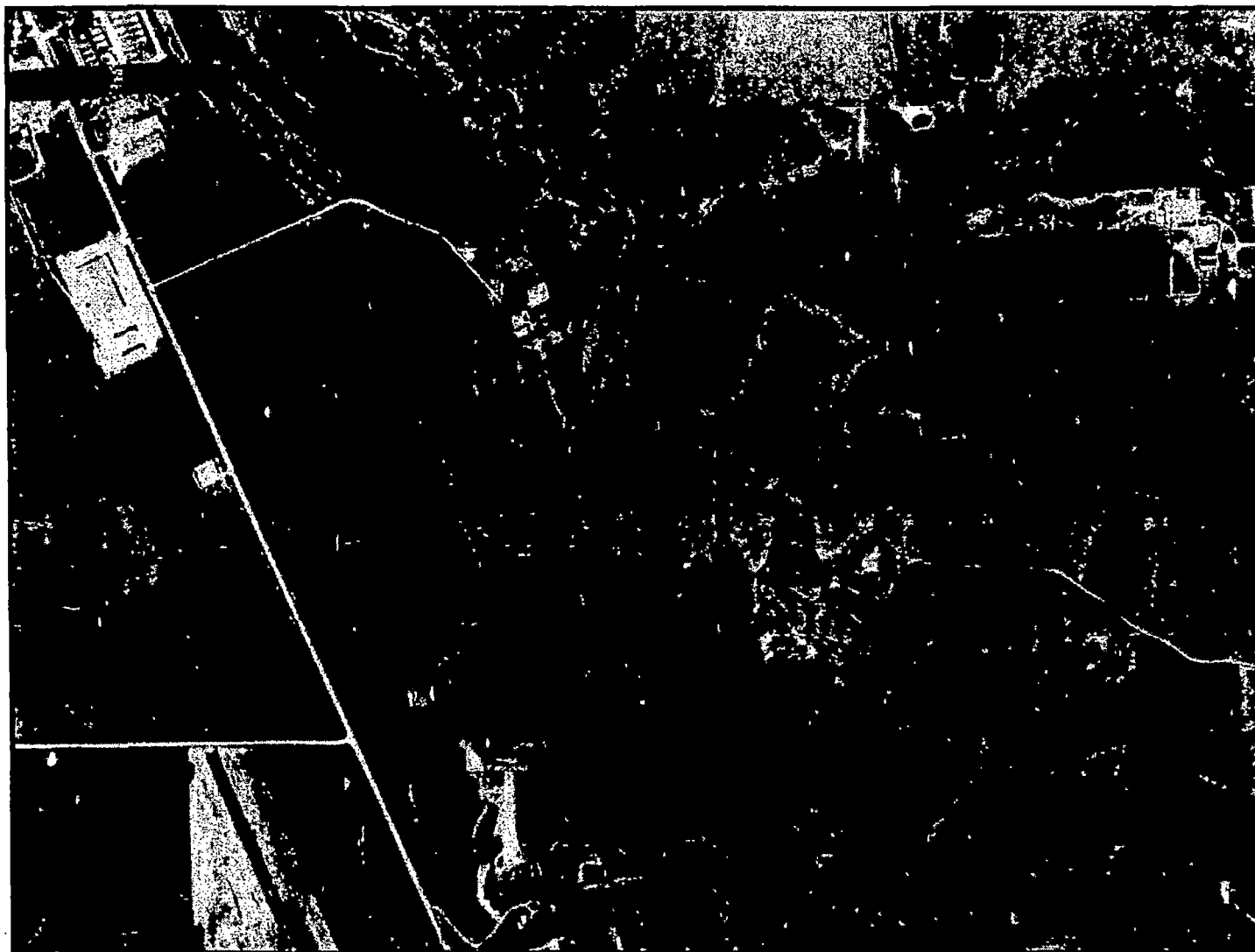


Illinois



Quadrangle Location

Figure 1



Technical Support Section
Chicago, Illinois

Figure 2. Ray Holtman Farm (1969 ASCS aerial photograph)

Scale = 1:10150

SURFACE WATER - Ray Holtman Farm

Chemical	Ecotox Threshold Criteria I		Background SW-1	SW-3	SW-3 Duplicate	SW-4	SW-5 Creek South of Site
	AWQC/FCV II	Tier					
<u>VOCs</u> (ug/l)							
<u>SVOCs</u> (ug/l)							
Phenol			5				4
2-Methylphenol			2				
4-Methylphenol			10				<u>11</u>
Butylbenzylphthalate	19		1	0.8	1	1	
Bis(2-Ethylhexyl)phthalate	32		0.6			<u>23</u>	<u>3</u>
<u>Pesticides/PCBs</u> (ug/l)							
<u>Inorganics</u> (ug/l)							
Aluminum			249	205	178	44.1	<u>14,400</u>
Antimony							
Arsenic	190 As+3	8.1	3.0		1.3	1.9	<u>7.6</u>
Barium	3.9		336	<u>172</u>	<u>168</u>	<u>136</u>	<u>495</u>
Beryllium	5.1						
Cadmium	1.0 h						
Calcium			135,000	113,000	111,000	107,000	116,000
Chromium	180 h Cr+3 10 Cr+6						<u>15.7</u>
Cobalt	3.0		4.5				<u>10.5</u>
Copper	11 h						<u>15.1</u>
Iron	1,000		2,650	453	400	119	<u>44,800</u>
<u>Inorganics</u> (continued)							
Lead	2.5 h						<u>17.5</u>
Magnesium			61,100	57,200	56,300	53,300	<u>87,600</u>
Manganese	80		5,890	<u>302</u>	<u>291</u>	68.2	<u>2,020</u>
Mercury	1.3						
Nickel	160 h						<u>20.1</u>
Potassium			1,720	1,700	<u>1,950</u>	<u>3,360</u>	<u>12,100</u>
Selenium	5.0						
Silver							

Sodium		104,000	53,600	52,700	50,900	103,000
Thallium					<u>1.0</u>	
Vanadium	19	2.9	<u>3.0</u>	<u>3.3</u>	<u>3.0</u>	<u>33.2</u>
Zinc	100 h		<u>4.5</u>			<u>77.1</u>
Cyanide	5.2					

NOTES: 1ECO Update: Ecotox Thresholds (EPA 540/F-95/038)

AWQC: Chronic Ambient Water Quality Criteria (Freshwater)

FCV: EPA-derived Final Chronic Value (Freshwater)

Underlined values above background

Boxed values above criteria

Shaded values above background *and* criteria

SURFACE SOIL - Ray Holtman Farm, 1993

Chemical	Risk Based Criteria	Background SS-3 200 ft South of Access Road , 150' West of 24th St.	SS-1 Along Embankment, 300 ft West of 24th St.	SS-1 Along Embankment, 600 ft West of 24th St.
<i>VOCs</i> (ug/kg)				
<i>SVOCs</i> (ug/kg)				
Di-n-butylphthalate				280
Bis(2-Ethylhexyl)phthalate		68	<u>200</u>	<u>120</u>
SVOC TICs				
<i>Pesticides/PCBs</i> (ug/kg)				
Dieldrin		31		5.0
4,4'-DDE				5.1
4,4'-DDD				2.2
4,4'-DDT			2.8	15
Methoxychlor				1.6
Gamma Chloridane			0.43	
<i>Inorganics</i> (mg/kg)				
Aluminum		9,540	9,030	8,900
Antimony				
Arsenic		6.6	<u>18.4</u>	2.9
Barium		99.1	140	83.3
Beryllium		0.40	0.52	0.34
Cadmium	1.2 ERL			
Calcium		2,020	<u>3,140</u>	<u>10,800</u>
Chromium	81 ERL	15.1	17.0	18.0
Cobalt		7.0	<u>10.6</u>	8.3
Copper		8.0	12.4	<u>28.7</u>
Iron		11,600	18,700	11,900
Lead		9.8	<u>9.3</u>	8.1
Magnesium		1,470	2,370	6,710
Manganese		542	<u>653</u>	260
<i>Inorganics</i> (continued)				
Mercury				
Nickel	21 ERL	10.1	20.3	18.4
Potassium		1,230	1,140	1,210
Selenium				

Silver				
Sodium		129	110	<u>322</u>
Thallium			<u>0.38</u>	
Vanadium		28	39.7	31.1
Zinc	150 ERL	42.0	44.1	46.6
Cyanide				

NOTES - IECO Update: Ecotox Thresholds (EPA 540/F-95/038)

SQB: Sediment Quality Benchmark by equilibrium partitioning

ERL: Effects Range Low

Underlined values above background

Boxed values above criteria

Shaded values above background **and** criteria

SEDIMENTS - Ray Holtman Farm, 1995

Chemical	Ecotox Threshold Criteria1	Backgroun d SS-1	SS-3	SS-3 Duplicate	SS-4	SS-5 Creek South of Site
<u>VOCs</u> (ug/kg)						
1,1,1-Trichloroethane	170 SQB				1	
Toluene	670 SQB	2				
<u>SVOCs</u> (ug/kg)						
<u>Pesticides/PCBs</u> (ug/kg)						
Aldrin		20				
Heptachlor expoxide		5.5				
4,4'-DDE		8.9				
4,4'-DDT	1.6 ERL	20				
Endrin aldehyde		1.9				
Alpha-Chlordane						<u>1.2</u>
Gamma-Chlordane		9.5				2.1
Aroclor-1248	23 ERL	790				
Aroclor-1254	23 ERL	320				
<u>Inorganics</u> (mg/kg)						
Aluminum		3,270	<u>3,360</u>	<u>3,510</u>	2,710	<u>6,570</u>
Antimony						
Arsenic	8.2 ERL	21.2	7.7	6.6	2.6	<u>12.4</u>
Barium		370	95.3	82.3	47.4	184
Beryllium		0.82	0.38	0.49		0.50
Cadmium	1.2 ERL					
Calcium		3,830	<u>2,410</u>	<u>18,500</u>	<u>4,470</u>	<u>30,360</u>
<u>Inorganics</u> (continued)						
Chromium	81 ERL	16.4	7.7	13.1	5.2	11.7
Cobalt		31.4	8.6	8.1	4.2	8.7
Copper	34 ERL	11.1	7.6	10.6	5.4	<u>14.3</u>
Iron		32,600	12,500	17,400	6,670	30,900
Lead	47 ERL	26.8	9.4	9.5	6.8	15.4
Magnesium		866	<u>1,940</u>	<u>2,220</u>	<u>1,200</u>	<u>5,320</u>
Manganese		2710	641	576	253	936
Mercury	0.15 ERL					
Nickel	21 ERL	26.8	14.2	16.1	7.2	15.6
Potassium		337	<u>434</u>	<u>455</u>	<u>361</u>	<u>780</u>
Selenium						

Silver						
Sodium		73.8	48.2	58.5	46.2	<u>100</u>
Thallium		0.36	<u>0.43</u>	<u>0.37</u>	0.31	<u>0.46</u>
Vanadium		59.6	18.6	25.0	11.7	25.6
Zinc	150 ERL	38.9	21.2	25.7	17.4	<u>59.0</u>
Cyanide						

NOTES - 1ECO Update: Ecotox Thresholds (EPA 540/F-95/038)

SQB: Sediment Quality Benchmark by equilibrium partitioning

ERL: Effects Range Low

Underlined values above background

Boxed values above criteria

Shaded values above background **and** criteria

RESIDENTIAL WELLS - Ray Holtman Farm

Chemical	Drinking Water Criteria		Backgroun d RW-1	RW-4 Southwes t of Site	RW-4 Duplicate	RW-5 Northeast of Site	Field Blank
	Risk Based MCL Level						
<u>VOCs</u> (ug/l)							
Toluene	1,000	750				<u>1</u>	1 (trip)
Chloroform	60	150					1
<u>SVOCs</u> (ug/l)							
Bis(2-Ethylhexyl)phthalate	6	4.8	2	<u>13</u>	1	<u>4</u>	1
<u>Pesticides/PCBs</u> (ug/l)							
<u>Inorganics</u> (ug/l)							
Aluminum		37,000					
		0					
Antimony	6	15					
Arsenic	50	0.045					
Barium	2,000	2,600	203	76	76	164	
Beryllium	4	0.016					
Cadmium	5	18					
Calcium			99,000	70,000	70,000	96,000	
Chromium	100	37,000 Cr+3 180 Cr +6					
Cobalt		2,200					
Copper	1,300	1,500	12	9	9		
Iron		11,000		<u>2,160</u>	<u>2,330</u>	<u>119</u>	
Lead	15						
Magnesium			45,000	25,000	25,000	40,000	
<u>Inorganics</u> (continued)							
Manganese		180	8	<u>74</u>	<u>75</u>	7	
Mercury	2	11					
Nickel	100	730					
Potassium							

Selenium	50	180					
Silver		180					
Sodium			32,000	71,000	72,000	31,000	19,000
Thallium	2						
Vanadium		260					
Zinc		11,000		59	55	74	
Cyanide	200	730					

NOTES: Underlined values above background

Boxed values above criteria

Shaded values above background *and* criteria

GROUNDWATER - Ray Holtman Farm

Chemical	Drinking Water Criteria		Background RW-1	GW-2 South Central	GW-7 West Central	GW-8 Northwest	GW-8 Duplicate	GW-9 Southwest
	Risk Based MCL Level							
VOCs (ug/l)								
SVOCs (ug/l)								
Phenol	22,000					<u>1</u>	<u>0.9</u>	
Bis(2-Ethylhexyl)phthalate	6	4.8	2	2,000		6	2	
Pesticides/PCBs (ug/l)				NA				
Inorganics (ug/l)								
Aluminum	37,000			NA	<u>12,100</u>	<u>2,090</u>	<u>4,520</u>	<u>72.7</u>
Antimony	6	15		NA				
Arsenic	50	0.045		NA	31.4		1.6	1.0
Barium	2,000	2,600	203	NA	<u>297</u>	195	<u>212</u>	<u>264</u>
Beryllium	4	0.016		NA				
Cadmium	5	18		NA				
Calcium			99,000	NA	<u>119,000</u>	<u>105,000</u>	<u>104,000</u>	<u>116,000</u>
Chromium	100	37,000 Cr ⁺³ 180 Cr ⁺⁶		NA	<u>27.4</u>	<u>5.4</u>	<u>11.1</u>	
Cobalt	2,200			NA	<u>33.8</u>		<u>4.0</u>	
Copper	1,300	1,500	12	NA	<u>28.4</u>		6.6	
Iron		11,000		NA	26,300	<u>4,130</u>	11,400	947
Lead	15			NA	<u>13.2</u>	<u>2.0</u>	<u>3.2</u>	

GROUNDWATER - Ray Holtman Farm

Chemical	Drinking Water Criteria Risk Based MCL Level		Background RW-1	GW-2 South Central	GW-7 West Central	GW-8 Northwest	GW-8 Duplicate	GW-9 Southwest
Magnesium			45,000	NA	<u>69,100</u>	<u>51,500</u>	<u>51,700</u>	<u>59,700</u>
Manganese		180	8	NA	<u>1,120</u>	<u>104</u>	<u>375</u>	<u>17.3</u>
<i>Inorganics</i> (continued)								
Mercury	2	11		NA			<u>0.12</u>	
Nickel	100	730		NA	<u>68.9</u>	<u>54.2</u>	<u>159</u>	<u>33.9</u>
Potassium				NA	<u>2,720</u>	<u>444</u>	<u>1,040</u>	
Selenium	50	180		NA		<u>1.1</u>		<u>1.0</u>
Silver		180		NA				
Sodium			32,000	NA	<u>49,100</u>	<u>35,000</u>	<u>35,200</u>	<u>35,000</u>
Thallium	2			NA	<u>1</u>			
Vanadium		260		NA	<u>43</u>	<u>8.2</u>	<u>16.0</u>	<u>3.2</u>
Zinc		11,000		NA	<u>100</u>	<u>8.6</u>	<u>27.6</u>	
Cyanide	200	730		NA				

NOTES: Underlined values above background

Boxed values above criteria

Shaded values above background *and* criteria

NA -Not Analyzed; not enough sample could be collected